tracing (Fig. 2) shows the radial and jugular pulse during eight seconds.

The postmortem examination was made by Dr. J. H. Larkin. The heart (Fig. 3) showed a calcareous nodule, situated precisely in the path of the bundle of His. This nodule was evidently the cause of the complete heart block observed during life.

THE TECHNIQUE OF OPERATIONS ON THE LOWER PORTION OF THE URETER.[1]

By Charles L. Gibson, M.D.,

SURGEON TO ST. LUKE'S HOSPITAL; CONSULTING GENITO-URINARY SURGEON TO THE CITY HOSPITAL, NEW YORK.

In performing any operation, but more particularly in the abdomen, a sufficient exposure of the operative field is necessary for efficient and safe work. There are few parts of the body where it is so difficult to obtain these conditions as in operations at the pelvic outlet, particularly when seeking to remove stones situated in that portion of the ureter which lies below the pelvic brim. Of course, it is easy enough to make a ruthless incision which resembles the technique of the morgue rather than the operating room; but in this country, certainly, we very justly do not consider that the mere completion of an operation spells success: we judge its value by the end results. For it cannot be said to be a gain for a patient to have the trouble caused by the presence of a ureteral stone replaced by a huge and weak scar which allows of eventration of the abdominal contents, a condition of permanent danger and discomfort.

In work which entails opening the ureter, I assume that the weight of evidence is in favor of procedures which do not permit urine to find its way into the peritoneum. Other debatable points are: Shall we attempt to close an intentionally opened ureter, and, shall we provide prophylactic drainage against a possible urinary leak—in other words, shall we deliberately relinquish the opportunity to secure complete closure and union of this abdominal wound?

In my judgment the ideal method of performing operations on the lower ureter should fulfil the following conditions: The incision of the abdominal wall should be of such a size and situation as to give an ample exposure for the easy recognition of the ureter, the necessary manipulations, and security from injury to the other pelvic structures, particularly the iliac vessels. The incision should be extraperitoneal. It should be possible to make the ureter so freely accessible that any incision in it can be as easily and accurately repaired as a lesion of the intestine. There should be no unnecessary trauma or malhandling of the tissues, so that the completion of the operation should leave a perfectly dry field, doing away (when the continuity of the ureter has been restored) with the necessity of drainage—a prophylactic measure against subsequent hernia. The incision of the abdominal wall should be so planned as to produce the least damage, allowing when it is closed without drainage a firm union without risk of hernia. Finally, the whole operation should be so simple, so free from annoying hemorrhage or other pitfalls, that it can be performed without undue waste of time—half an hour or less.

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[1] Read at a meeting of the American Association of Genito-urinary Surgeons, June 1, 1909.

These ideals, I believe, can be realized by a suitable exposure of the ureter and the lower pelvis by an incision which I offer for consideration.

The description of the incision and the various steps are as follows: The original idea of the incision was to utilize the advantages of the Stimson-Pfannenstiel incision, which is used frequently, particularly in gynecological laparotomies. I have used it in probably a hundred such laparotomies, and believe it is the least likely to be followed by hernia. Familiarity with the anatomy of the abdominal wall and abdominal incisions generally will be necessary for a successful execution of the several steps.

The skin incision runs from the mid-line about a finger's breadth above the pubes, horizontally outward nearly parallel to Poupart's ligament at first (Fig. 1), and curves rather sharply upward at its mid-point to end about opposite the anterior superior spine of the ilium. This incision is deepened in the same line through the aponeurosis of the external oblique and the internal oblique muscle, —the latter is the only structure which suffers any real damage, and only to a slight degree, for the lower part of the incision runs about parallel to its fibers, only the ascending leg cuts across a small part of these fibers. The incision stops short of the transversalis, which is not disturbed at all. With efficient retraction of the upper flap the external border of the rectus muscle is identified (Fig. 2) and the *fascia* of the transversalis is now divided by a vertical incision close to and parallel to the rectus—that is, at *right angles* to the original incision. Two retractors are now inserted, the outer one retracts the cut edge of the transversalis outward, the other (Fig. 3) pulls the rectus muscle well toward the mid-line. A generous space is thus obtained, situated well toward the mid-line (the lower part of the ureter is practically in the mid-line, and difficult of access by other extraperitoneal exposures). The floor of this space is occupied by the peritoneum. The patient being in a complete Trendelenburg position, the peritoneum is easily and gently pushed away, and a free access to the pelvis is secured. So ample is the space and view, that the whole hand can be introduced under the control of the eye. The ureter is released from its surroundings and easily brought to the external level of the wound (Fig. 4). In this way it can be handled as readily and freely as a loop of intestine.

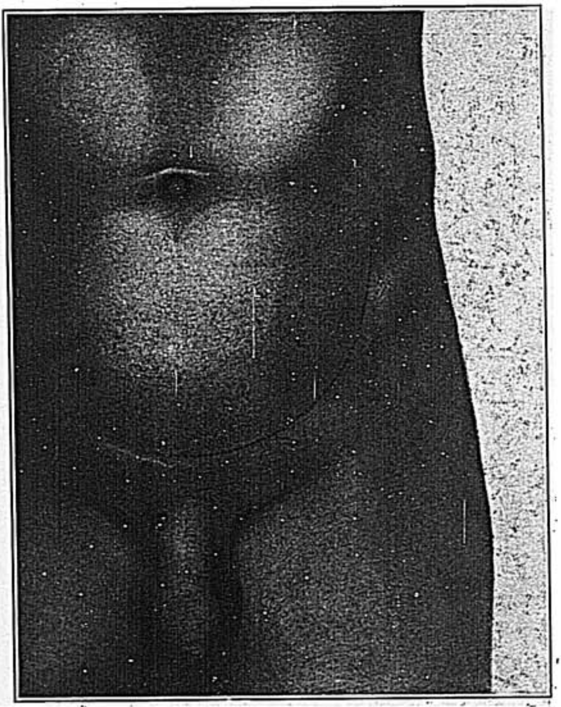

FIG. 1.—The superficial incision.

After removal of the stone, the ureter is closed with a double layer of the finest chromicized catgut, the first going through all the layers, the superficial sutures reinforcing the first. The ureter is then dropped back. The operative field, protected by a gauze pad during the ureteral manipulations, will be found perfectly dry. The wound is closed without drainage. The transversalis fascia is sutured separately with catgut. Continuous sutures of medium-sized catgut (preferably moderately chromicized) are used for the combined internal and external oblique layer. A few interrupted fine catgut sutures are used for the superficial fatty layer. Very fine continuous silk sutures are used for the skin. A sterile dressing and a firm binder are applied. Rest in bed for ten days is enjoined, when, if asepsis has been irreproachable, the wound will be found firmly healed, and the patient may resume his usual activities.

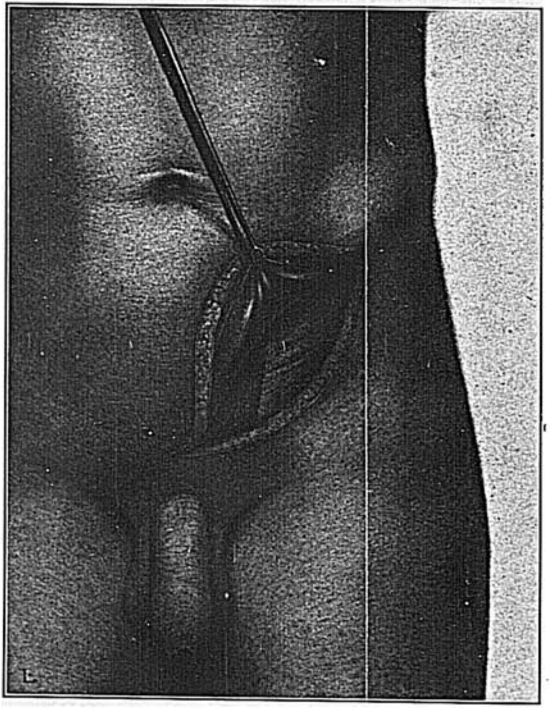

FIG. 2.—The upper flap consisting of skin, external and internal oblique muscles is retracted. The dotted line represents the line of incision in the transversalis fascia.

That these ideals can be realized is demonstrated by a brief recital of the following cases:

CASE I.—W. W., aged sixty-two years, male, was admitted to St. Luke's Hospital, November 13, 1907. For the past two years he has had a dull pain over the sacral region. The urine is cloudy and sometimes bloody. An *x*-ray examination showed the presence of a large stone (Fig. 5) in the lower left ureter. Operation, November 14, 1907. Under ether anesthesia the stone was easily

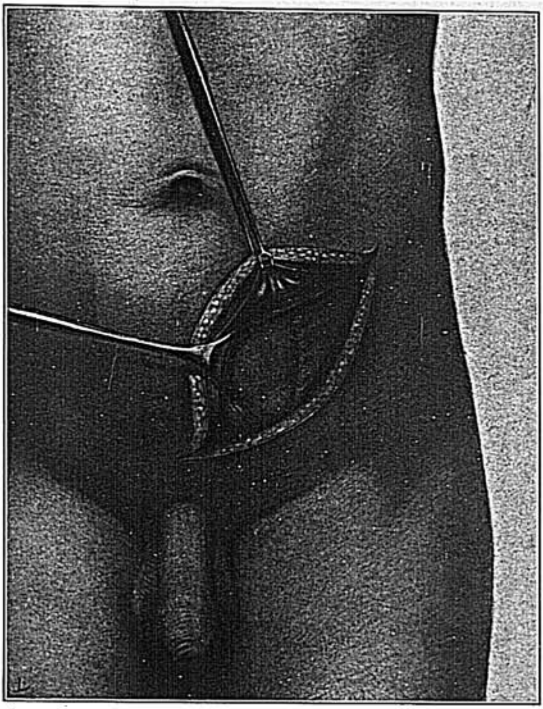

FIG. 3.—The edge of the rectus muscle is strongly retracted inward; between it and the cut edge of the transversalis fascia the peritoneum is exposed.

palpated per rectum. It was removed according to the technique just described. Time of the operation, thirty-five minutes. Convalescence was uneventful. The highest temperature (rectal) was 100.4°. The wound healed by first intention. On November 29 the patient was allowed up. On December 3 he was discharged cured. At an examination on May 26, 1909, the scar (Fig. 6) was firm, and there was no hernia.

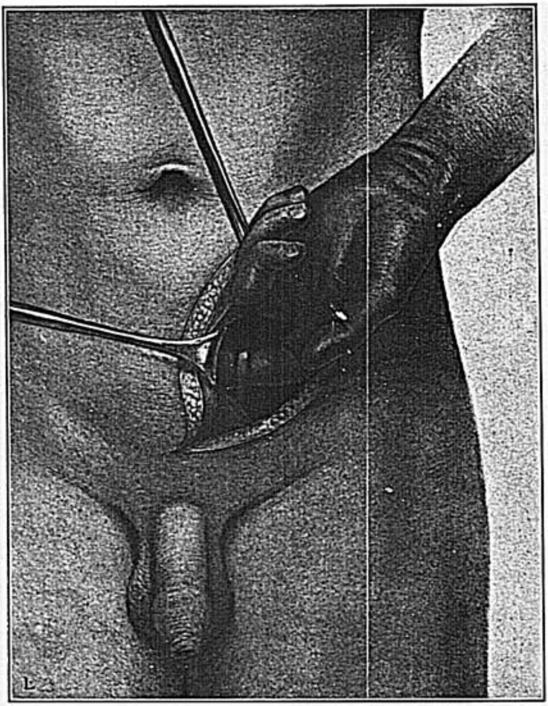

FIG. 4.—The peritoneum has been pushed upward. The ureter is lifted out of the pelvis and brought to the level of the external wound.

Case II.—P. M., male, aged thirty-eight years, was admitted to St. Luke's Hospital, March 11, 1908, having been previously in the hospital for the same trouble. The hospital *x*-ray technique having failed to find a stone, although the symptoms were classical, I invoked the kind assistance of Dr. W. E. Cauldwell, who promptly located the stone in the lower part of the left ureter. Operation was done on March 17, 1909, by the technique described above; the time of operation was twenty-eight minutes. Convalescence

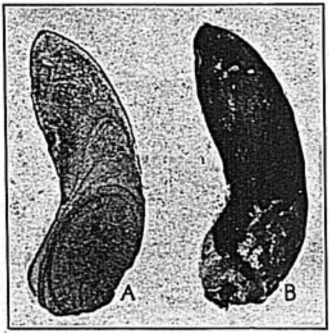

Fig. 5.—Ureteral calculus from Case I. Weight, 18 grams. *A*, sawn surface; *B*, external surface.

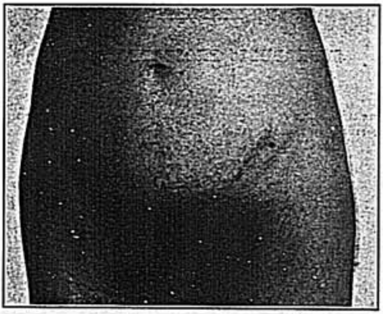

Fig. 6.—Scar eighteen months after the operation (Case I).

was uneventful. The highest temperature (rectal) 101.4° occurred the day after operation. At the first dressing, on March 24, the wound was well healed. On March 27, the patient was allowed up. On March 30, feeling very well, he was allowed to go home, being discharged cured. An examination on May 27, 1909, showed the scar (Fig. 7) firm, and no hernia.

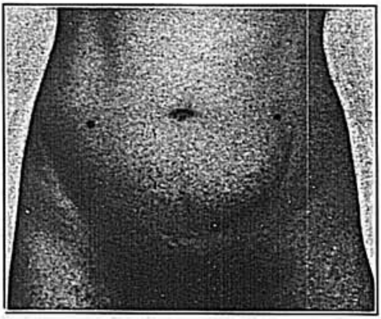

FIG. 7.—Scar fourteen months after operation, (Case II.)

SUPRAPUBIC PROSTATECTOMIES.

BY CHARLES H. CHETWOOD, M.D.,
PROFESSOR OF GENITO-URINARY SURGERY IN THE NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL; ATTENDING SURGEON TO BELLEVUE HOSPITAL; CONSULTING SURGEON TO ST. JOHN'S HOSPITAL, NEW YORK.

IF I read aright the temper of the surgical mind today, we no longer speak of different camps in prostatic surgery—the perineal prostatectomist and the suprapubic prostatectomist. An understanding has developed between these disputing factions, and it is more generally recognized that, as there are different kinds of prostatic enlargements—broadly speaking, those that are high up and those that are low down—so there are some cases best suited to the high or suprapubic operation and others to the low or perineal; while there are borderland cases which are as well attacked by either one of these routes.

The statistics prepared by Watson and Cunningham[1] seem to show a better percentage of complete recoveries following the suprapubic operation as compared with the perineal route; while the percentage of operative risk favors the selection of the perineal operation. Yet a progressive decrease in mortality is apparent in both instances, and up to now the perineal technique has probably received much greater attention than the high operation. I am disposed to believe that the future will develop the latter operation to a considerable extent.

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[1] Diseases and Surgery of the Genito-urinary System, 1909.

As it is true, as is clearly set forth by Waston, that the suprapubic is a complete operation, having a large percentage of cures and a small percentage of operative complications, and is rapid of performance, under conditions which afford free access to the gland, it is a matter of serious importance that effort should be made to improve the technique and bring down the mortality rate.

This communication is devoted to the consideration of six cases of suprapubic prostatectomy, representative of different phases of the subject, operated upon in the last six months, except one of them, which was operated upon somewhat more than one year ago.

A brief resume of the cases is as follows: The patients are aged seventy, seventy-two, sixty, seventy-five and sixty years respectively. The duration of symptoms was from one to twenty years. Urination: Complete retention in three cases; frequent and difficult urination in the remainder, with residual urine from four to twelve ounces. Pain was present in a greater or lesser degree in all cases. Infection had occurred in all of them with one exception; that is to say, the urine was cloudy and bacterial, and in three there was ammoniacal decomposition. The urethral length varied from eight and one-half to nine and three-quarter inches. Rectal examination revealed the prostates to vary in size from that of a slight median enlargement to five times the normal dimensions. Bladder exploration was possible in all but one case; and it was possible to recognize with the sound an intravesical median projection. Examination of the urine showed moderate implication of the kidneys in half the cases. Other complications were a stone in one case, glycosuria in one case, carcinoma in one case, and one patient suffered from extreme obesity.

Operation was primary in all cases with one exception, in which it was performed secondarily to a previous perineal prostatectomy. The operation was done in two steps in one case, on account of the unsatisfactory general condition, very foul urine, and much prostatic congestion. Convalescence was prompt and uninterrupted in all except one case, in which it was protracted.

The latest report following operation varies from one to thirteen months. The result has been return of voluntary urination in all cases; and elongation of interval between the urination from complete retention and fifteen minutes to one hour frequency before, to a minumim of two hours and a maximum of six hours following operation. The urine has become clear in three cases, and remains